

REMARKS

The rejections and comments of the Examiner set forth in the Office Action dated March 13, 2003 have been carefully reviewed by the Applicants. The Applicants thank the Examiner for the allowance of Claims 36-45.

Claims 29-30, 32-34, and 46 are currently rejected under 35 U.S.C. 103(a) as being unpatentable over Thei et al. (US 6350662) in view of Wolf et al. (Silicon Processing for the VLSI Era Volume 1: Process Technology, Lattice Press, Sunset Beach, CA USA pp. 218-19, 228, 1986). Applicants respectfully traverse the rejection on the grounds that a motive to combine the teachings of Thei and Wolf is lacking.

The rejection holds that "Wolf et al. suggests using a low temperature method of SiO₂ plasma CVD to fill the trench so as to avoid high process temperatures and possible formation of defects in the fill step. Motivation is the avoidance and prevention of defects." On page 219, Wolf teaches that "as with other low temperature techniques for preparing SiO₂ (CVD, PECVD) these plasma oxidized films have inferior electrical properties compared to thermal SiO₂ grown at 1000° C. Note that these properties can be substantially improved by post-oxide thermal treatment in an oxidizing ambient."

As can be seen from the passage of Wolf cited above, Wolf teaches that low temperature processes for preparing SiO₂ produce films that are inferior to thermally grown SiO₂ films (i.e., defective). Wolf also teaches that the properties of the defective low temperature films may be substantially improved by thermal treatment. This is in

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direct contradiction to the assertion in the rejection that "Wolf suggests using a low temperature method of SiO₂ plasma CVD to fill the trench so as to avoid high process temperatures and possible formation of defects in the fill step." Wolf in fact teaches that low temperature SiO₂ deposition processes produce defective films that require thermal treatment to remove the defects.

Wolf teaches that that low temperature SiO₂ deposition processes produce inferior films and require thermal treatment for improvement. In light of this, it is unlikely that one with normal skill in the art would replace the HDP fill process of Thei with the low temperature process denigrated by Wolf.

Claims 31, 35, 47, and 48 are currently rejected under 35 U.S.C. 103(a) as being unpatentable over Thei et al. and Wolf et al. , as applied above and further in view of Olsen et al. (US 6150234). Applicants respectfully traverse the rejection on the grounds that a motive to combine the teachings of Thei and Wolf is lacking, as explained above.

It is also significant that Olsen, in agreement with Thei, teaches that a HDP oxide trench fill be used (column 4, lines 18-20). Thei and Olsen both teach the use of HDP oxide as a trench fill, whereas Wolf has nothing in particular to say with respect to SiO₂ used as a trench fill, and denigrates low temperature SiO₂, saying that further thermal treatment is required. In view of Olsen, the motive to combine Thei with Wolf is further removed, as Olsen teaches the same trench fill as Thei.

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In summary, Applicants assert that Claims 29-35 and 46-48 are in condition for allowance and earnestly solicit such action by the Examiner.

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Respectfully submitted,

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